

Application No.: 10/658,173

Docket No.: JCLA10431

REMARKSPresent Status of the Application

The Office Action rejected all presently-pending claims 1-16. Specifically, the Office Action rejected claims 1, 4-5, 8-10, 13 and 16 under 35 U.S.C. 102(e), as being anticipated by Jo et al. (U.S. 2003/0117325 A1). The Office Action also rejected claims 2-3, 6-7, 11-12 and 14-15 under 35 U.S.C. 103(a) as being unpatentable over Joe et al. in view of Ngounou Kouam et al. (U.S. Patent 6,606,062). Applicants believe that claims 1-16 are already distinguished over the cited arts. For the reasons set forth below, Applicants respectfully request reexamination and reconsideration of the present invention as a whole. Applicants also respectfully request that the rejections be withdrawn.

Summary of Applicants' Invention

The Applicants' invention is directed to an antenna, which is derived from the monopole type antenna, with a printed compensating capacitor. The antenna has a radiator located over one surface (e.g. one surface of a printed circuit board) and comprising a tuning section. By bending a portion of the tuning section of the antenna to **directly overlap a ground layer disposed on another surface (e.g. another surface of a printed circuit board)** and thereby to form a compensating capacitor with the ground layer, the length of the tuning section is reduced and the reduced capacitance due to decreasing of the tuning section can be compensated by the compensating capacitor.

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**Discussion of Office Action Rejections**

*The Office Action rejected all presently-pending claims 1-16. Specifically, the Office Action rejected claims 1, 4-5, 8-10, 13 and 16 under 35 U.S.C. 102(e), as being anticipated by Jo et al. (U.S. 2003/0117325 A1) and stated that the cited reference has disclosed all the claimed features of the present invention. Further, the Office Action also rejected claims 2-3, 6-7, 11-12 and 14-15 under 35 U.S.C. 103(a) as being unpatentable over Jo et al. in view of Ngounou Kouam et al. (U.S. Patent 6,606,062) and mentioned that the combination of the cited arts possesses the claimed features of the present invention.*

Applicants respectfully traverse this rejection and respectfully submit that Jo et al. is legally deficient for the purpose of anticipating claims 1, 5 and 9 because Jo et al. fails to disclose each element of the claim under consideration. Applicants believe that claims 1, 5 and 9 have already clearly defined the method according to the present invention. As stated above, claims 1, 5 and 9 recite:

Claim 1. An antenna on a printed circuit board (PCB) with a compensating capacitor, the antenna comprising:

a radiator disposed over a first surface of the PCB, wherein the radiator includes a short circuit stub section, a signal feeding section, and a tuning section coupled together at a joint, wherein the tuning section includes a bending portion;

a signal feeding line, disposed on the first surface of the PCB and electrically coupled to the radiator at the signal feeding section of the radiator; and

*a ground layer, disposed on a second surface of the PCB, one terminal of the short circuit stub section being electrically coupled to the ground layer, wherein the bending portion of the tuning section is overlapping with the ground layer to form the compensating capacitor.*

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Claim 5. An antenna on a printed circuit board (PCB) with a compensating capacitor, the antenna comprising:

a radiator disposed over a first surface of the PCB, wherein the radiator includes a signal feeding section and a tuning section coupled together at a joint, wherein the tuning section includes a bending portion;

a signal feeding line on the first surface of the PCB, electrically coupled to the radiator at the signal feeding section of the radiator; and

*a ground layer, disposed on a second surface of the PCB,*

*wherein the bending portion of the tuning section is overlapping with the ground layer to form the compensating capacitor.*

Claim 9. A method for forming an antenna on a printed circuit board (PCB), the method comprising:

forming a radiator over a first surface of the PCB, wherein the radiator at least includes a signal feeding section and a tuning section coupled at a joint;

forming a signal feeding line on the PCB, wherein the signal feeding line is electrically coupled to the radiator at the signal feeding section; and

*forming a ground layer over a second surface of the PCB,*

*wherein a portion of the tuning section is arranged to have overlapping with a portion of the ground layer to form a compensating capacitor.*

(*Emphasis added*). Applicants assert that claims 1, 5 and 9 patently define over the cited art for at least the reason that the cited art fails to disclose at least the features emphasized above.

In the present invention, in order to decrease the length of the tuning section without spoiling the characteristics of the tuning section, only a portion of the tuning section is bended to overlap the ground layer while the length of the tuning section is reduced. More specifically, since only the bending portion of the tuning section overlaps the ground layer to form a compensating capacitor between the bending portion of the tuning section and

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the ground layer, the compensating capacitor can compensate the lost of capacitance due to reducing the length of the tuning section.

However, in the cited art, Jo et al. emphasize that all the radiator 10 is disposed over a ground plane 12 (paragraph 0032). Furthermore, Jo et al. neither mention nor suggest that the radiator can be disposed to shift away from the ground plane and only a portion of the tuning section overlaps the ground layer. In other words, Jo et al. fails to teach how to reduce the tuning section without affecting the required LC coupling effect.

In addition, the antenna provided by Jo et al. is one type of microstrip antennas. It is well known in the art that the microstrip antenna is physically and theoretically different from the monopole type antenna. More specifically, although microstrip antenna and monopole type antenna are antennas, the operation mechanism of the microstrip antenna and that of the monopole type antenna are different. As shown in the attachment labeled as Exhibit A, which is a copy of pages 66-68 and 210-216 of Antenna Theory and Design, 2<sup>nd</sup> edition by Warren L. Stutzman, Gary A. Thiele, it is clearly that microstrip antenna mentioned in chapter 5, section 5.8 (pages 210-216) is **physically and theoretically different from** the monopoles type antenna described in chapter 2, section 2.3.2 (pages 66-68). Therefore, Applicants respectfully submit that the technology field to which Jo et al. refer is different from the technology field to which the present invention refers and people skilled in the art will not refer to the monopole type antenna technology for manufacturing the microstrip antenna. Hence, Applicants respectfully submit that the present invention is patentably distinguished over the cited art according to the reasons cited above.

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Further, even though Ngounou Kouam et al. mention about the extending ground 4 (shown in Fig. 1 of the cited reference, U.S. Patent 6,606,062), the combination of the cited arts provided by Jo et al. and Ngounou Kouam et al. still fail to possess the features as same as what the present invention claims since Jo et al. neither provide motivation for reducing the tuning section of the radiator nor suggest to bend a portion of the tuning section and to overlap the ground layer only with the bended portion of the tuning section . Moreover, People skilled in the art who want to reduce the length of the tuning section of an antenna derived from the monopole type antenna but have trouble to keep the required LC coupling effect will not modify Jo et al.'s microstrip antenna by referencing Ngounou Kouam et al's idea since the technology field of the monopole antenna is different from that of the microstrip antenna.

For at least the foregoing reasons, Applicants respectfully submits that independent claims 1, 5 and 9 patently define over the prior art references, and should be allowed. For at least the same reasons, dependent claims 2-4, 6-8 and 10-16 patently define over the prior art as well.

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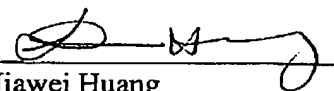
CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1-16 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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